Fall 2018

CE 632-103: Design of Prestressed Concrete Structures

Rajendra Navalurkar

JOHN A. REIF, JR. DEPARTMENT OF
CIVIL AND ENVIRONMENTAL ENGINEERING

NJIT New Jersey Institute of Technology

CE 632 - Design of Prestressed Concrete Structures Fall 2018
Section: 103

Text: Nawy, Edward G., Prestressed Concrete - Fundamental Approach, 5th Edition Updated
Prentice Hall, 2009, ISBN: 0-13-6081509

Instructor: Dr. Raj Navalurkar, PE, Rajendra.navalurkar@parsons.com
CE 632 - Section 103 Tuesday 6-9:05PM Room 212 Central King Building

Prerequisites: undergraduate course in theory and design of reinforced concrete. Analysis and design of pre-tensioned prestressed concrete elements for both determinate and indeterminate structures will be studied. Examples of prestressed elements used in buildings and bridges will be discussed, as well as the source and magnitude of prestress losses.

Week	Topic	Homework
1	Introduction, Prestressing Methods, Prestressing Systems, General Design Principles. Chapter 1	To be assigned in class
2	Materials for Prestressing; Steel (strength, plasticity, relaxation, corrosion. Concrete strength, elastic modulus, and shrinkage and creep properties. Chapter 2	To be assigned in class
3,4	Prestress Losses, Effect of Friction, Relaxation, Creep and Shrinkage, Specifications and Practical Design Solutions. Chapter 3	To be assigned in class
5,6	Basic Principles for Flexural Design; Service Load Design, Minimum Section Modules, Limiting Eccentricities, Shape and Size Selections, Practical Considerations. Chapter 4	To be assigned in class
7	End Anchorage and Bearing. Chapter 4	To be assigned in class
8	Mid-Term Exam	

Week	Topic	Homework
9	Ultimate Strength Flexural Design. Chapter 4	
10	Shear (and Torsion) Design. Chapter 5	To be assigned in class
11	Camber, Deflections, and Crack Control - Serviceability. Chapter 7	To be assigned in class
12	Continuity in Prestressed Beams; Elastic Analysis, Load-Balancing Method. Chapter 6	To be assigned in class
13	Compression Members and Tension Members. Chapter 8	To be assigned in class
14	Introduction to Two-Way Prestressed Concrete Floor Systems. Chapter 9	To be assigned in class
15	Final Exam	

Grading

1. Homework ----- 20% (must do all homework)
2. Term Exam ----- 30%
3. Final Exam ----- 50%

100%

*The NJIT Honor Code will be upheld, and any violations will be brought to the immediate attention of the Dean of Students.
*Students will be consulted with by the instructor and must agree to any modifications or deviations from the syllabus throughout the course of the semester.